Weather Note

MEASUREMENT OF WIND SPEEDS NEAR A TORNADO FUNNEL

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On April 2, 1957, a tornado struck Dallas, Tex. During this storm at a site about 1,500 feet from the tornado path, Mr. Maurice Levy, a photographer for the National Broadcasting Co., took some excellent pictures with a 16 mm. movie camera exposing at 24 frames per second. In all, nearly 600 frames were exposed.

A Weather Bureau meteorologist from the Kansas City Research Unit later measured angles and distances at the Dallas site for use in computing distances and sizes of features shown in the pictures. The Research Unit enlarged the individual frames to 4-inch x 5-inch prints to facilitate the computations. One set of computations was made to study the horizontal motion of identifiable particles of debris, about the funnel vortex. Of these, 149 individual particles were considered large enough and could be traced long enough to yield significant measurements. Their movements were traced for periods in excess of 100 frames. The time interval covered was short enough that for all practical purposes the distance between camera and funnel could be taken to be constant. Each particle was identified on the prints involved, and the particle's apparent direction of motion, relative size, and instantaneous position relative to the vortex were recorded.

By trigonometry, the path of the particles was found to be about a circle of approximately 300 feet in diameter. Deviations did not exceed 10 percent. The speed of the particles was obtained by measurement of the distance traveled against the time involved. This distance traveled is defined as the apparent movement corrected for curvature of the path. The maximum speed obtained from this method was 212 miles per hour.*

It must be mentioned, however, that this is only the speed of a particle which does not necessarily reach the speed of the wind. The relation of the particle speed to the actual wind speed depends upon the aerodynamic properties of the particle itself, and this information is not available.

*Mr. Walter Hoecker of the Office of Meteorological Research, U.S. Weather Bureau, Washington, D.C., using another movie from another place along this tornado's path, obtained a rather close value, about 170 m.p.h. (personal communication).

New Weather Bureau Publication

Technical Paper No. 36, "North Atlantic Tropical Cyclones," Washington, D.C., 1959, 214 pp.; for sale by Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C. Price $1.00.

Charts show (A) tracks of all known tropical cyclones of tropical storm intensity (sustained winds of 39 m.p.h. or over) for each year 1886 through 1958; (B) tracks of tropical cyclones beginning in each 10-day period during the six months of maximum frequency, June through November, for the years 1886 through 1958; and (C) tracks of tropical cyclones beginning in each decade of years, 1891–1950, during the months of June, July, and November, and during each 10-day period in August, September, and October. A short text accompanies the charts.